

ABSTRACT

Sub B1

A catalyst having activity under the irradiation of a visible light, said catalyst being an oxide semiconductor such as an anatase type titanium dioxide, having stable oxygen defects. A method for producing a catalyst having activity under the irradiation of a visible light which comprises treating an oxide semiconductor with hydrogen plasma or with a plasma of a rare gas element, comprising performing said treatment in a state substantially free from the intrusion of air into the treatment system. An article comprising a base material having the catalyst above provided on the surface thereof. A method for decomposing a substance, comprising bringing an object to be decomposed into contact with the catalyst above under the irradiation of a light containing at least a visible radiation. A novel photocatalyst which enables use of a visible radiation is provided, as well as a method utilizing the photocatalyst for removing various substances containing an organic matter or bacteria by photodecomposition.